REMARKS

The above amendments to the above-captioned application along with the following remarks are being submitted as a full and complete response to the Final Office Action dated January 6, 2009. In view of the above amendments and the following remarks, the Examiner is respectfully requested to give due reconsideration to this application, to indicate the allowability of the claims, and to pass this case to issue.

Status of the Claims

As outlined above, claims 2-5, 7-15, 17, and 35 stand for consideration in this application, wherein claims 2, 17, and 35 are being amended. Claims 18-34 stand withdrawn from consideration in this application.

All amendments to the application are fully supported therein, including but not limited to Figures 13, 16, 55 and 56, and their corresponding narratives. Applicants hereby submit that no new matter is being introduced into the application through the submission of this response.

Formal Objection

The Examiner objected to claim 2 for a minor informality. As outlined above, claim 2 is being amended to correct the informality and to more particularly point out and distinctly claim the subject invention. Withdrawal of this formal objection is in order and thus respectfully requested.

Prior Art Rejection

The Examiner rejected claims 2-5, 7-15, 17 and 35 under 35 U.S.C. §103(a) as being unpatentable over George et al. (U.S. Patent No. 5,774,669) in view of Kracht (U.S. Patent No. 6,377,987), but further in view of the newly-cited Kingsford et al. (US Patent No. 6,574,737). Applicants have considered the above-noted rejection, and hereby respectfully traverse.

The present invention as recited in claim 2 is now directed to a method of automatically recognizing a network configuration, for automatically recognizing a device configuration on a network system having a network node including at least one or more intelligent network devices each implementing an SNMP agent and a management information base, the method comprising: a first step of sending an ICMP echo request from

an administrator terminal implementing an SNMP manager to individual network devices in the network node, and detecting existence and non-existence of network devices on the basis of responses therefrom, the administrator terminal implementing an SNMP manager, wherein the network devices include at least one device having plural IP addresses except for a router; a second step of creating plural different SNP messages each for inquiring whether or not the network devices support IP forwarding function and one or more of management information bases included in each SNIVP message wherein the management information bases (MIBs) include a bridge MIB. a repeater MIB and a printer MIB, sending the plural SNMP messages one by one to the SNMP agents in network devices of which existence was detected to exist in the first step, and detecting the types of the network devices in the network node based on information of success and failure of sending and receiving the plural SNMP messages and based on combinations of information stored in management information bases included in the received SNMP messages, wherein the types of the individual network devices and roles of the individual network devices in the network node are determined based on the combinations of the information stored in the management information bases included in the received SNMP messages and wherein the type of device does not indicate the role of device primarily in terms of the device having the plural IP addresses except for the routers; a third step of acquiring a set of physical addresses of network devices connected to ports of a network devices from the management information base of the network device, the network device being a type of device to have a bridge function; a fourth step of acquiring information as to physical-1P address correspondence from the management information base of a network device having a routing function; and a fifth step of recognizing at an XP level the network devices connected to each of the ports of the network device having a bridge function, based on the acquired information as to physical-IP address correspondence.

As recited in claim 17, the present invention is directed to a system for automatically recognizing a network configuration, wherein an administrator terminal implementing an SNMP manager automatically recognizes a device configuration on a network system having a network node including at least one or more intelligent network devices each implementing an SNMP agent and a management information base, the administrator terminal implementing an SNMP manager comprising: first means for sending an RCMP echo request to individual network devices in the network node, and detecting existence or non-existence of network devices on the basis of responses therefrom, wherein the network devices include at least one device having plural IP addresses except for a router; second means for creating

plural SNP messages, each of the plural SNMP ins inquiring whether or not the network devices support IP forwarding function and one or more of management information bawl included in each SNMP message wherein the management information bases (Mills) include a bridge MIB, a repeater MIB and a printer MIB, sending the plural SNMP messages one by one to the SNMP agents in network devices of which existence was detected by the first means, and detecting the types of the network devices in the network node based on information of success and failure of sending and receiving the plural SNMP messages and based on combinations of information stored in the management information bases included in the received SNMP messages, wherein the types of the individual network devices and roles of the individual network devices in the network node are determined based on the combinations of the information stored in the management information bases included in the received SNMP messages and wherein the type of device does not indicate the role of device primarily in terms of the device having the plural IP addresses except for the router; third means for acquiring a set of physical addresses of network devices connected to ports of a network device from the management information base of the network device, the network device being a type of device to have a bridge function; fourth means for acquiring information as to physical-IP address correspondence from the management information base of a network device having a routing function; and fifth means for recognizing at an IP level the devices connected to each of the ports of the network device having a bridge function, based on the acquired information as to physical-IP address correspondence.

Further, as recited in claim 35, the present invention is directed to a method of automatically recognizing a network configuration, for automatically recognizing a device configuration on a network system having a network node including at least one or more intelligent network devices each implementing an SNMP agent and a management information base, the method comprising: a first step of sending an ICMP echo request from an administrator terminal implementing an SNMP manager to individual network devices in the network node, and detecting existence and non-existence of network devices on the basis of responses therefrom, wherein the network devices include at least one device having plural IP addresses except for a router; and a second step of creating plural SNP messages, each of the plural SNMP messages inquiring whether or not the network devices support IP forwarding function and one or more of management information bases included in each SNMP message wherein the management information bases (MIBs) include a bridge MIB, a repeater MIB and a printer MIB, sending the plural SNMP messages one by one to the SNMP

agents in the network devices of which existence was detected in the first step, and detecting the types of the network devices in the network node based on information of success and failure of sending and receiving the plural SNMP messages and combinations of information stored in management information bases included in the received SNMP messages, wherein the types of the individual network devices and roles of the individual network devices in the network node are determined based on the combinations of the information stored in the management information bases included in the received SNMP messages and wherein the type of device does not indicate the role of device primarily in terms of the device having the plural IP addresses except for the router.

Among the features of the present invention, the present invention as recited in claims 2, 17 and 35 defines how to determine the role of device, except for a router, having plural IP addresses. As discussed in the prior response, the type of device does not always indicate the role of device. For example, a network device sometimes operates as a router if it has at least two NICs (Network Interface Cards). On the other hand, a network device sometimes operates as a terminal device even if it has at least two NICs and if the NICs are not set up properly. In such cases, only referring to the MIB by SNMP is not sufficient to recognize the role of the device correctly because a device having at least two NICs each which has an IP address may be recognized as a router if determining only by MIB. That is, it can not be determined correctly whether or not each IP address is connected to the network until polling operations to the at least two IP addresses are actually performed by an echo request, as in the present invention. The present invention not only monitors the value of ipForwarding shown in Fig. 13, but also uses data on at least one of a DF-Term model, a IF-term model and a SF-Term model (see Fig. 28) to determine whether an IP address of another segment is stored in a port or performs polling by an echo request to detect whether a device includes at least two NICs. Thus, sending the SNMP request after the echo request is useful to identify the roles of the network devices.

In particular, the system inquires, using plural SNP messages, whether or not the network devices support an IP forwarding function and one or more of management information bases included in each SNMP message. The management information bases (MIBs) include a bridge MIB, a repeater MIB and a printer MIB. The system sends the plural SNMP messages one by one to the SNMP agents in the network devices of which existence was detected. Then, the system detects the types of the network devices in the network node based on information of success and failure of sending and receiving the plural

SNMP messages and combinations of information stored in management information bases included in the received SNMP messages.

Neither George nor Kracht teaches or suggests determining the types of the individual network devices and roles of the individual network devices in the network node based on the combinations of the information stored in the management information bases included in the received SNMP messages wherein the type of device does not indicate the role of device primarily in terms of the device having the plural IP addresses except for the router. Kracht only teaches determining types of network devices based on identification information from SNMP agents in the network devices, wherein the type of device indicates the role of device directly, such as a printer, a router and so on. Kracht does not provide any teaching or suggestion for how to determine the role of a device when the type of device is known from the identification information but the device other than being a router has plural IP addresses. Kingsford is only cited for that a network device can have plural IP addresses.

However, George, Kracht and Kingsford are all completely silent as to the above-discussed features of the present invention as now claimed. Thus, any combination of George, Kracht and Kingsford still falls short of embodying any structure or operation even remotely similar to those of the combination of elements in the present invention as now claimed. In other words, even if all three references were combined, such a combination would not show or suggest, among other features, a system that inquires, using plural SNP messages, whether or not the network devices support an IP forwarding function and one or more of management information bases included in each SNMP message wherein the management information bases (MIBs) include a bridge MIB, a repeater MIB and a printer MIB, the system sends the plural SNMP messages one by one to the SNMP agents in the network devices of which existence was detected, and then, the system detects the types of the network devices in the network node based on information of success and failure of sending and receiving the plural SNMP messages and combinations of information stored in management information bases included in the received SNMP messages.

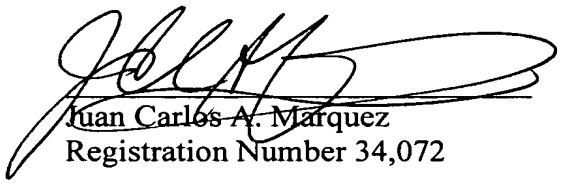
Consequently, Applicants will contend that the present invention as recited in at least the independent claims 2, 17 and 35 is distinguishable from and thereby allowable over the prior art of record. As to dependent claims 3-5 and 7-15, the arguments set forth above with respect to independent claim 2 are equally applicable.

Conclusion

In view of all the above, Applicant respectfully submits that certain clear and distinct differences as discussed exist between the present invention as now claimed and the prior art references upon which the rejections in the Office Action rely. These differences are more than sufficient that the present invention as now claimed would not have been anticipated nor rendered obvious given the prior art. Rather, the present invention as a whole is distinguishable, and thereby allowable over the prior art.

Favorable reconsideration of this application as amended is respectfully solicited. Should there be any outstanding issues requiring discussion that would further the prosecution and allowance of the above-captioned application, the Examiner is invited to contact the Applicants' undersigned representative at the address and phone number indicated below.

Respectfully submitted,



Juan Carlos A. Marquez
Registration Number 34,072

REED SMITH LLP
3110 Fairview Park Drive
Suite 1400
Falls Church, Virginia 22042
(703) 641-4200

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JCM/